

## **Simulations of a Large Area Inductively Coupled Plasma Source**

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The development of large area, high density plasma processing reactors requires knowledge of the plasma structure in order to design systems which yield highly uniform ion fluxes to the substrate. We describe here simulations of the LLNL large area (76 cm diameter) plasma source chamber. The chamber is driven by a planar ICP coil using 3-50 mTorr pressures of either Ar or N<sub>2</sub>. Measurements are described in the abstract of Benjamin, et al. (this conference). Simulations made using the LLNL INDUCT94 plasma modeling code show the effects of variations in the rf inductive power, pressure, and coil design. Comparisons between the simulations and experimental data show excellent agreement both plasma spatial structure and in the magnitude of the ion densities. From simulations studies we are able to describe the processes which govern etch uniformity. We find that ion flux uniformity can vary both with pressure and power. Results are shown for ion density and flux profiles for conditions used in the LLNL experiment and for a modified coil system optimized for uniformity.

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